A REPORT ON THE INCORPORATION OF LOW VISION AIDS INTO THE ORIENTATION AND MOBILITY PROGRAM OF LOW VISION CLIENTS

BY DENNIS N. CORY AND JOHN C. PRINCE

Digitized by the Internet Archive
in 2012 with funding from
Lyrasis Members and Sloan Foundation

http://archive.org/details/reportonincorpor00denn

A Report on the Incorporation of Low Vision Aids into the Orientation and Mobility Program of Low Vision Clients

for

The Department of Blind Rehabilitation

710 Project - Fall 1975

by

Dennis N. Cory and John C. Prince

Neatly done + well organized - Unfortunately you used only monocular aids which are no use in traveling and limited to orientation from a stationary position. You should have more training in the outdoor portion

HV5108
C819
Copy one

Table of Contents

I. Introduction 1

II. Lesson Plan Sequence 6

III. Materials and Photographs 41

IV. Bibliography 61

Introduction

It is the purpose of this paper to report on the incorporation of certain low vision aids into the orientation and mobility training programs of a number of participants in the Summer Round-Up held from June 22, 1975, through August 1, 1975, at the Michigan School for the Blind, Lansing, Michigan. The incorporation of the aids into these programs was based primarily on what we perceived to be the needs of the individual clients as we evaluated their performance in the first days of the Round-Up. Such an incorporation can, of course, fit into an overall visual training program that holds that "learning experiences play an important role in perceptual development and that it is possible to improve visual functioning and efficiency through training."[1] We were, however, fully aware that such improvement based on the use of low vision aids would come about only through proper training.[2] At the same time we realized that the foundation for proper training consisted in part of the proper selection of low vision aids. Our objectives, linked closely, became 1) to properly evaluate and screen the clients, making sure the program we developed fit their needs; 2) to test and evaluate the individual client in regard to adequate aid prescription; and 3) to prepare a structured series of lessons which would provide a program built on training sessions followed by exposure to travel situations, eliminating unstructured experience with the aids.

---

[1] Cleves Kederis and S. C. Ashcroft, "The Austin Conference on Utilization of Low Vision," Education of the Visually Handicapped 2 (May 1970):35. This potential is also noted by Bruce Blasch and Robert O. LaDuke, A Program to Increase Efficiency of Distance Vision for the Partially Sighted, U.S. Office of Education, Grant No. 0-8-71112-1995(607), Nov. 29-Dec. 1, 1970.

[2] This is expressed, for example, by Edwin Mehr and Allan Fried, Low Vision Care (Chicago: The Professional Press, Inc., 1975), p. 155.

Although George Keller states: "With partially sighted who do not need the aid of the cane the primary service to be rendered is one of counseling to help the individual achieve a realistic understanding of his limitations,"[3] we prefer to replace the word "limitations" with "potential" and emphasize the opportunities to better convey and understand the environment and thus avoid a program of instruction in which partially sighted and blind are uniformly classified.[4] With this philosophy in mind the project itself, the lesson plans, materials and observations which were developed and are recorded below grew according to the clients needs and potential rather than from a clearly defined research hypothesis. For this reason no generalization of observations is intended beyond the level of the suggestion. However, we do feel that many of the observations, some of which are not unique to this paper, could very well form the basis for formal research, given the time, funding, and subject availabilities.

In spite of this lack of generalization, the report seems justified much in that same manner that Barraga concluded, among other things, that her 1964 study "contributed to the literature a detailed set of lesson plans . . . which might be used in future educational programming or research."[5] The project may, in a small way, help to alleviate the situation which led Randall Jose et al. to remark that "the use of low vision aids in mobility-training has not

---

[3] A Mobility Project with Blind Public School Students and Other Rehab Clients, Maryland State Department of Education, July 1970, p. 4. See in this regard: Paul J. Schulz, "Psychological Factors in O & M Training," New Outlook 65 (May 1972):129-34.

[4] As in the program described in C. Flanagen and H. Robertsen, A Concentrated O & M Approach for the Improvement of the Education for Partially Seeing and Blind Children in Day School Settings, Kansas State Department of Education, December 1969.

[5] Increased Visual Behavior in Low Vision Children, American Foundation for the Blind, New York, 1964, p. 89.

been fully exploited."[6] It is also intended to expand on such short articles as those by Charles Koehler and Suzanne Petrizzi, in which the potential of the low vision aid is noted but not detailed.[7]

Although it would go beyond the scope of this report to detail the development of low vision emphasis,[8] the history of the use of low vision aids,[9] the various programs concentrating on near vision,[10] or the programs dealing in screening and setting up low vision clinics,[11] additional related literature will appear in this report as we discuss the evaluation of the clients, the selections of appropriate aids and the organization of the lesson plans.

---

[6] "The Model Clinical Low Vision Service," New Outlook 69 (June 1965):252. Jose's assumption, however, that no one has attempted bicycle riding with the telescopic lens worn in frames is contradicted by a case study from Hines V. A. Hospital (unpublished). For more on telescopic spectacles see, Gerald Fonda, "Evaluation of Telescopic Spectacles," Journal of America Ophthamology (September 1961):433-35. Due to lack of facilities for fitting, our experience with this type of aid was limited to the clip-on in isolated situations.

[7] Charles Koehler, "The Use of Optical Aids to Assist the Partially Seeing in Mobility," Long Cane News 4/3 (January 1971):9-10. Suzanne Petrizzi, "Low Vision Aids, Monocular Aids, and Sunware Used in Diagnostic Orientation and Mobility Program at the New York Association for the Blind," Long Cane News 4/3 (January 1971):11-12.

[8] See, e.g., Robert Silver, "Using Residual Vision," New Outlook 60 (October 1966):236-38; Regina Little, "Getting the Most Out of Visual Aids," New Outlook 59 (March 1965):141-44; Eleanor E. Faye, "Low Vision: A Symposium," Springfield, Illinois, 1975.

[9] See, e.g., Jacqueline A. Lynch, "A Review of the History of Low Vision Aids and the Implications of This for the Future," Unpublished 710 Paper, Western Michigan University, 1967.

[10] See, e.g., Alice Wood, comp., "Instructional Manual for Visual Skills," V.A. Hospital, Palo Alto, California, 1975; Natalie Barraga, Increased Visual Behavior in Low Vision Children, American Foundation for the Blind, New York, 1964.

[11] See, e.g., Eleanor E. Faye et al, "Low Vision Services in An Agency: Structure and Philosophy," New Outlook 69 (June 1975):241-48; Randall T. Jose et al., "The Model Low Vision Clinical Service: An Interdisciplinary Vision Rehabilitation Program," New Outlook 69 (June 1975):249-54; Kent and Constance Carter, "Itinerant Low Vision Services," New Outlook 69 (June 1975):255-60.

Some O & M personnel involved in training low vision clients have come to regard the ophthalmologist's report with a certain degree of scepticism as it relates to functional travel ability.[12] As we began the screening and evaluation of clients in Lansing to determine which ones might benefit from training with low vision aids we also encountered such remarks as "light perception" and "counts fingers" which were of little value in determining the functional potential of the clients. This brought to mind Barraga's findings that "some children with distance acuities so low that it was reported as 'counts fingers' or 'object perception' were also registered as print readers."[13] It also reinforced the philosophy which serves as the foundation for functional evaluation currently in use in agencies such as the V. A. Hospitals at Hines and Palo Alto.[14]

Our evaluation followed closely the format of the Hines program as expanded somewhat by the Perkins School for the Blind program, Mobility for the Partially Sighted.[15] The initial stage included a low vision clinical evaluation in the low vision clinic of the Michigan School for the Blind conducted with the aid of Mr. Marvin Weessies.[16] We then evaluated indoor and outdoor performance without low vision aids. This was followed by the organization of training programs for

---

[12] "Editorial," Low Vision Abstracts 1/2 (Spring 1972). Answered by Robert Eisenberg's letter to the editor, Low Vision Abstracts 1/4 (Spring 1973). Points out the difference of opinion which characterizes this problem.

[13] Barraga, Increased Visual Behavior in Low Vision Children, p. 5.

[14] "Hines Evaluation of Functional Vision," Hines V. A. Hospital, No date, (Mimeographed). See also James Doyle and Nancy Darling, "Functional Vision," Long Cane News 4/3 (January 1971):6-8.

[15] Kathy Morse et al., Mobility for the Partially Sighted, Perkins School for the Blind, Revised Edition, January 1975.

[16] For more detail on testing methods for low vision clients see, e.g., Gerald Fonda et al., "Low Vision Correction for Congenital Cataracts and Surgical Aphakia in Children," Sight-Saving Review 39 (Summer 1969):85-92. See also Kent and Constance Carter, "Itinerant Low Vision Services," p. 256.

those clients who we felt would benefit from training. This program's lesson plan sequence is presented in detail below. A brief description of the clients and the aids used precedes it.

Clients--

C. A 9-year old male, visual impairment due to genetic imbalance; Feinbloom acuity 20/200, visual field 90°; no previous O & M instruction; long cane use was not indicated by the functional evaluation

M. A 10-year old female, visual impairment not specified on eye report, Feinbloom acuity in good lighting 20/200, visual field not measurable; no previous O & M instruction; long cane indicated only for travel at night

R. A 12-year old female, visual impairment due to Hallerman-Streif-Francois Syndrome (congenital cataracts); Feinbloom acuity 20/200, visual field 120°; no previous O & M instruction; long cane not indicated by functional evaluation.

Mi. A 15-year old male, visual impairment due to birth defect; Feinbloom acuity 20/200, visual field 100°; 6 years previous O & M experience using collapsible cane

Low Vision Aids Used--

I. Selsi 2.5x 26mm Monocular (focusable)

This aid magnifies two and one-half times and may be used both indoors (ex. chalkboard reading) and outdoors. Due to its low magnification, it is good for scanning of environment to obtain a general survey of an area.

II. Swift (Hunt scope) 4x Monocular (non-focusable)

This magnifies 4 times and has a field of view of 20 degrees. It can be used in both indoor and outdoor environments.

III. Selsi 6x 30mm Monocular (focusable)

This aid magnifies six times and has a field of view of seven and one-half degrees. It is hand held and may be used both indoors and outdoors. It is good for scanning the environment and has been suggested for use at the theater, at sports events and for spotting bus numbers and signs.

IV. Selsi 6x 18mm and 8x 24mm Monoculars (focusable)

This aid has interchangeable lenses of 6x power magnification which has relatively good fields. The six-power lens has a relatively wide field of eleven degrees and the eight-power lens has a field of 8.2 degrees.

Lesson Plan Sequence

A. Training

  I. Training in Auditorium
  II. Continued Training in Auditorium
  III. Room Familiarization (School Setting)
  IV. Campus Familiarization (Lesson I)
  V. Campus Familiarization (Lesson II)

B. Residential

  VI. Residential Travel and Related Concepts
  VII. Residential Street Crossings
  VIII. Residential Numbering Systems (East-West)
  IX. Residential Numbering Systems (North-South)
  X. Drop-off in a Residential Area

C. Business & Store

  XI. Traffic Lights (Lesson I)
  XII. Traffic Lights (Lesson II)
  XIII. Business Area Familiarization (Lesson I)
  XIV. Business Area Familiarization (Lesson II)
  XV. Store Familiarization
  XVI. Mall Familiarization (Lansing Mall)
  XVII. Bus Familiarization

Lesson Plan Explanation and Description

The following sequence of 17 lessons must be understood as a system consisting of flexible units. Just as is the case with the standard O & M curriculum, here also the instructor must constantly alter both lesson length, content, and goals to fit the needs of the individual client. The lessons developed for the program in Lansing were, of course, based on locations available and desirable for the levels of each client. It is felt that other instructors should, with little difficulty, be able to transfer the types of locations to their own areas and the home areas of their clients.

We are presenting the lessons in this report in both the sequence and length used during the program. It is indeed possible that application of these lessons in another environment might require alteration, but in the case of those children who carried out the lessons in Lansing, the schedule proved adequate. For example, all the clients in Lansing mastered residential street crossings with little difficulty; other clients might need several lessons on this segment. This would seem to correlate with Barraga's comments on the improvement of visual efficiency in general which she feels is a

> matter of learning which involves the development of: 1) attention in order to bring stimulus within visual range; 2) awareness and recognition of visual form which involves cortical and emotional factors; 3) response which is an indication that learning is occurring; 4) satisfaction, an emotional component, which determines the success or failure of the learning process; 5) repetition, the means by which learning patterns are fully established.[17]

It cannot be overemphasized then that no claim to completeness nor structural rigidity is intended by this series of lessons. We consider it much more a foundation upon which further such lessons can be developed and successfully carried out with low vision clients.

---

[17] Barraga, Increased Visual Behavior in Low Vision Children, p. 8.

Lesson I

I. Objective:

Introduction to low vision aids in an indoor environment.

II. Location:

Lions' Hall Auditorium, an auditorium measuring 45' by 76' with a stage elevated 40' at one end. This location was chosen in order to provide a controlled environment which would be consistent for each client. No visual or auditory distractions are present and it is possible, by marking the floor with tape, to measure accurately the distances of the clients from the various test objects. The auditorium also offers a single location in which a variety of test objects can be presented.

III. Procedure:

Outside the actual auditorium the client is told that this orientation and mobility lesson will be a game based on the use of certain low vision aids. The purpose of the aids is explained briefly. The client is asked to enter the auditorium and proceed in the direction of the stage until the form of the bowling pin which has been placed at the center and on the edge of the stage is recognized. The point at which the client recognizes the pin is the starting point for the lesson. Focusing of the aid, as well as proper grip and support of the grip arm (see Fig. 1) are explained using the bowling pin as an initial reference. After the client is able to locate and fixate the bowling pin with the low vision aid, a series of objects are presented, one

at a time, at a point either one foot to the left or one foot to the right of the reference point. The order of presentation follows:

1. The Feinbloom Chart, alternating sides of the pin as well as number size
2. Standard geometrical shapes
   a. 5" equilateral triangle to right of pin (see Fig. 2)
   b. 5" square to right of pin (see Fig. 3)
   c. 5" circle to left of pin (see Figs. 4 & 4a)

IV. Observations:

A. Client fatigue, accompanied by a lack of concentration may be evident in initial lessons

B. Give the client frequent breaks and keep lessons short

C. Initially aids providing the widest field may also make scanning patterns more successful

D. Position the client so that the lighting does not interfere with use of the aid

E. The test objects should be chosen with the age of the client and his level of conceptual development in mind

F. Scanning pattern control, that is how the instructor knows what the client is seeing at a particular time, is dependent on good client-provided information

G. Several short interruptions in the lesson not only rest the client but also provide further practice in relocating the reference point

H. Avoid questions which can be answered by "yes" or "no," such as "Do you see this?" Ask rather "What is this?", "Where is this object in relation to the reference point?" "Describe this."[18]

I. Limit the area which must be scanned in the first lessons

J. Provide an interesting and very definite visual reference point

---

[18] This type of questioning is discussed by Hugo Vigoroso, "The Partially Sighted Client," Long Cane News 4/2 (April 1970):4-10 and Charles B. Margach, "Spatial Perceptions in Low-Visioned Persons," paper presented at the Biennial Conference of the Association for the Education of the Visually Handicapped, Toronto, Canada, June 1968.

K. Difficulty in holding the aid still may be a function of poor coordination or misunderstanding of proper body movement during scanning

L. Move from low to high power aids in any tasks where the client expresses the desire to see an object more clearly

M. Ask the client for his personal evaluation of each aid used

N. Any opportunity to use unaided vision should be exploited

Lesson II

I. Objective:

Continued introduction to low vision aids in an indoor environment by reviewing Lesson I and introducing tracking.

II. Location:

Lions' Hall Auditorium (see Lesson I).

III. Procedure:

The targets to be used in the lesson are presented to the subject prior to the exercise to make sure he is familiar with them before he is asked to identify them using the low vision aid. The client establishes the starting point as in Lesson I. After the client has located the bowling pin with the low vision aid, a series of objects will be introduced, one at a time, at points varying from one foot to several feet to the right or the left of the pin which is again used as the reference point. The order of presentation follows:

1. Standard geometric shapes at same distance from client as pin
   - a. 5" circle to right of pin at one foot
   - b. 5" square to right of pin at three feet
   - c. 5" triangle to right, then left of pin at two feet
   - d. 5" single line, first vertically, then horizontally at one foot (see Fig. 5)
   - e. 5" double lines, first horizontally, then vertically at five feet (see Fig. 6)
2. Standard geometric shape nearer or farther from client than pin
   - a. 5" square to right and closer (3 feet)
   - b. 5" circle to left and farther (3 feet)
   - c. 5" single line to left and closer (3 feet)
   - d. 5" triangle to right and farther (1 foot)
   - e. 5" double lines to right and same distance

To conclude the lesson on a light note the client will track a rolling basketball slowly along the base of the stage. This will be done first without and then with an aid. The task will also include locating and walking to the ball.

IV. Observations:

A. If the client has difficulty locating a particular object the correct alignment of the aid can be established by having the client locate the instructor at close range and then track him slowly to the area of the object to be located with the aid. The instructor can point to the object and have the client follow the arm to it

B. The instructor should be very precise in giving instructions to avoid client frustration in these early lessons

C. The heavier the aid the greater the possibility of young clients having difficulty holding it steady. This may, to varying degrees, also be the case with older patients

D. The clip-on aids add weight to the glasses, so that the client must keep his head up and avoid sudden head movement. Also it is important that the glasses fit snugly

E. Objects used in lessons of this type should have good contrast so that once located they are easily recognized. The emphasis here is more on proper scanning skills; identification will be stressed in later lessons

F. The background area for all objects should be a constant contrast and free of visual distractions such as windows, openings, moving curtains, etc.

G. An initial inability to track with the aid is not necessarily an indication of a lack of capability. Tracking visually without the aid may need to be practiced first in order to set a pattern for the use of the aid

H. It may be necessary to carry out some of the segments of this lesson from a seated position to avoid fatigue (see Fig. 7)

Lesson III

I. Objective:

Room familiarization utilizing residual vision and low vision aids.

II. Location:

Classroom of Michigan School for the Blind High School, measuring 18' x 46'. This indoor environment was chosen to provide realistic situations in which the subjects might find themselves during the school year. Also the presence of windows made it possible to introduce outdoor lighting variations into the lesson, such as glare and changing light intensity.

III. Procedure:

The client enters the room at the south door and is instructed to use this door as the starting point for the lesson. The client then visually scans the room following the west, then the north, and finally the east wall. At this point the client describes his impression of the room. Following this description the low vision aid is introduced and the previous scanning pattern is repeated with the aid (see Fig. 8). With the aid the pattern may be expanded to cover more area, that is starting at the baseboard in one corner of the room and moving right to left, then slightly upward and back to the right (see Fig. 9). The client is again requested to describe the room's features and the objects in it. A number of objects will be located at various points in the room to test for thoroughness of the scanning pattern (see Figs. 10, 11, & 12). The client is then given his freedom to reposition himself in the room to establish relationships between

objects and confirm from close range what he has visually located. Any objects of importance missed in the client's description will be used to practice scanning and locating.

IV. Observations:

A. Lighting conditions may make it necessary to change the position of the client in the room in order to avoid glare

B. If the client has difficulty locating any points, the instructor may wish to give auditory clues by first positioning himself near the point and then tapping it. This challenges the client more than the method in which he tracks the instructor walking to the point

C. The larger field given by lower power aids allows a less complicated scanning pattern than the higher power aids (compare Fig. 13 with Fig. 9)

D. Excessive training attempts in very familiar or laboratory like situations may lead to client disinterest[19]

E. Any signs or words which young clients are asked to locate should be either read in complete form if the client is able or simply spelled by the letter for verification of location

F. A low power aid (2.5x) may be effective for general impressions of a room, but the higher power (4x and 6x) can be more effective in locating and correctly identifying specific objects

G. The height and eye level of the client should always be considered in order to assure a free line of vision to a particular test object

H. Objects, such as tables and chairs, can disrupt the scanning pattern for beginning clients

I. It is helpful if reference points for scanning are at least vaguely discernible to the client without the use of the aid so that he can reorient his scanning by first locating the general area of the reference point and then applying the low vision aid

---

[19] Harold Richterman, "Mobility Instruction for the Partially Seeing," New Outlook 60 (October 1966):236-38 points out that "there can be some very wide deviations between the performances of a person with low vision aids in the laboratory setting and his ability to use the aids in a comparable manner when under actual independent travel training conditions." p. 236.

Lesson IV

I. Objective:

Campus familiarization (main campus).

II. Location:

Michigan School for the Blind, Lansing, Michigan. Aside from the practical considerations, that is the presence of the clients at the Summer Round-Up, this campus also offers buildings in symmetrical arrangements. There are numerous buildings available which are marked in large, easily found letters which lend themselves to scanning practice (see Fig. 14). The campus also has an intricate sidewalk system in both rectangular and circular format which offers good practice in locating sidewalk direction and intersections (see Fig. 15). This campus also offers young clients a beginning outdoor training situation with which they are not completely unfamiliar so that the tension which might be created in completely unfamiliar surroundings is avoided.

III. Procedure:

The client is positioned on the west side of the library and asked to scan the east-west sidewalk in front of him for an offset area with benches. The client travels to this area, is seated, and locates the building closest to him (the High School). He locates the name of the building with a scanning pattern using the low vision aid.[20] The client is again positioned on the sidewalk and asked to locate the first

---

[20] Research into scanning pattern effectiveness similar to Edward P. Berla's, "Strategies in Scanning a Tactual Pseudomap," Education of the Visually Handicapped 5 (March 1973):8-19 is still needed in the area of low vision aids.

intersecting sidewalk. From this intersection he locates the Main Building and its name. This procedure is repeated with Lions' Hall Auditorium and the Library. Landmarks and their use in orientation on campus are emphasized during scanning and travel. Such landmarks might be fountains, flagpoles, swings, benches, flower planters, and the buildings themselves. At the end of the lesson the client describes the positional relationship of the buildings on this section of campus.

IV. Observations:

A. The instructor should be aware of the effective range of each aid the client uses (refer to Lessons I & II)

B. As obvious as it may seem, it is noted here that the instructor should realize the potential instability of aid grip in cold weather

C. Initial scanning pattern practice may need to be accompanied by clues and hints from the instructor to insure some success in each task

D. The client's rejection of the low vision aid in general may indicate specifically an incorrect power or improper focusing

E. Location of intersecting sidewalks is best introduced at T-intersections

F. Avoid having the client look directly into the sun at any point in the lesson as he attempts to locate objects

G. All scanning which is profitable and possible without the aid should be done first before the low vision aid is utilized

Lesson V

I. Objective:

Campus familiarization (dormitory-gymnasium area).

II. Location:

Michigan School for the Blind campus (see rationale of Lesson IV).

III. Procedure:

The client is positioned on elementary hill and locates the triangular island. The client travels the circular sidewalk, locating buildings and building names, starting with the first building to the left of the island (elementary school, gym [main door] , Huron, Chippewa, Long House, Abie, C, Nandy, Blair and returns to island landmark). After familiarization, the client is positioned in the infield of the MSB track and locates specific buildings (gym, long house, Huron, etc.).

IV. Observations:

A. The client should be made aware of the relationship between light source and quality and effectiveness of the aid (the instructor should demonstrate this relationship by placing the client in situations where adverse lighting can be counteracted by a change in the client's position)

B. Gross images located visually without the aid can serve as landmarks; however the low vision aid can on occasion provide a more clear understanding of the nature of the landmark and thus lead to a more accurate formation of concepts

C. Application of the aid in situations where residual vision would have served the purpose can lead to rejection of the aid

D. Tasks should be chosen so that scanning procedures are required, which can be reinforced as the training progresses

E. Objects to be located should be approached from various angles to give the client practice in changing environments similar to those which he will encounter after training

F. After the visual range of the client has been established extremes either above or below this range should be avoided in beginning training sequences

Lesson VI

I. Objective:

Introduction to residential travel using the low vision aid in concept explanation and formation.

II. Location:

Residential block, beginning at the SW corner of the intersection of Maple and Chestnut Streets. This location offers those environmental factors which are necessary to check the concept development and needs of the client.

III. Procedure:

The client is positioned at the intersection of sidewalks and the following list of concepts is checked, explained and demonstrated from that point: incline, decline, curb, driveway, straight, corner, intersection, intersecting sidewalk, street, shoreline, grassline, traffic, perpendicular, parallel, block, street name, direction, house line, street sign, traffic sign. The low vision aid may be used in many of these concepts to clarify them or correct malformations. For example, using the aid to follow a straight sidewalk (see Fig. 16), to locate corners (see Fig. 17), reversing aid to survey more of intersection (see Fig. 18), following curb with aid from sidewalk or street (see Fig. 19), locating cars or garages in driveways (see Fig. 20), determining position of street signs (see Fig. 21), tracking parallel and perpendicular traffic (see Fig. 22), etc.

Observations:

A. An unobstructed view of the curb is best gained by positioning client in a street with no parked cars and little traffic

B. The client should be aware that the street sign he faces names his perpendicular street

C. The use of sidewalk, grassline, curb, and street to exemplify the concept straight also may familiarize the client with the arrangement of these in the environment. Thus it is best to use them in the order in which they are found, that is inner grassline, sidewalk, outer grassline, curb, street

D. By the same token, intersections can be approached using first intersecting sidewalks without the aid, then scanning and comparing street intersections either with reversed aid or regular aid use

E. It can be helpful to position client in the street intersection to have him organize the pattern of the intersection. A skywalk over an intersection is especially valuable in this regard

F. To insure accurate following of shoreline with the aid, it is wise to have the scanning done on a shoreline which offers identifiable objects which the client can detect as he scans

G. The client may wish to scan each block he travels in advance to check sidewalks for objects in his path

H. The client should be encouraged to identify everything he encounters while scanning for particular objects and to separate items useful as reference points and landmarks for later use during travel

I. Initial tracking of cars should start at intersection by having client fix on stationary vehicle and track it as it slowly accelerates from the intersection and away from the client

J. The client should always visually explore the corner upon which he is standing before initiating a search for a street sign on other corners

K. The concepts covered in beginning residential travel should be reinforced throughout the program

L. It was ascertained and demonstrated by one of our clients that in an outdoor environment there is a real gain in effectiveness by switching from a 4x to 6x aid, thus pointing out the need for flexibility. It might be assumed that training with aids in general eventually allows for smaller field and greater magnification as the client adapts to the patterns of search and scan

Lesson VII

I. Objective:

Review of Lesson VI and introduction to residential street crossings.

II. Location:

SW corner of Maple and Chestnut. This location was chosen to build on an area already familiar to the client; the streets are reasonably narrow thus making location of objects across streets less difficult; there is a great deal of shade allowing for scanning in all directions independent of sun position; the curbs and sidewalks offer good contrast to grasslines; the streets are lightly travelled but do offer tracking possibilities in the course of a lesson: street sign is visible from all corners of the intersection.

III. Procedure:

After an explanation of street crossing principles, the client will be asked to cross Maple, Chestnut, Maple, Chestnut. Should difficulty arise, particularly in linear locomotion, the low vision aid will be incorporated to establish the desired line of travel for the crossing; then the client will: a) locate curb, b) opposite sidewalk, c) scan the sidewalk (thus clearing to step-up to curb after crossing the street). The client verifies street names. Practice crossings are made: street sign is located from various angles and tracking practice may be carried out if necessary to establish parallel and perpendicular traffic patterns.

IV. Observations:

A. In scanning the grassline it is wise to position the client with one foot on the sidewalk and one foot in the grass

B. The scanning pattern for finding street signs is dependent on the general location of street signs in a given area; in Lansing, the street signs are generally found between the sidewalk and parallel street, so that scanning for the street sign was always started at the sidewalk and went to parallel curb

C. White pedestrian lines at crossing can aid in scanning to the opposite sidewalk.

D. Where street signs are obscured or not present, landmarks can replace them as verifiers of the location of the subject

E. Tracking can be a combination of non-aided and aided techniques so that the aid is used only after residual vision alone is not efficient

F. The subject must be able to translate magnified images and distances into the actual distance between the client and the object

G. It is often the case that unaided residual vision gives a better overall picture of the intersection than the reversed aid

H. The aid often facilitates the distinguishing of cars parked at some distance from the intersection from cars moving toward the intersection where the subject is attempting to cross

I. The aid can remove doubt as to the traffic pattern and flow at an intersection by making it possible to locate traffic signs and traffic lights, as well as to track the actual car movement

J. Rigid posture (wrist and arm position) becomes more important as the power of the aid increases

Lesson VIII

I. Objective:

Residential patterns and numbering systems.

II. Location:

Washington Street (the north-south street dividing Lansing into east and west sections) at Maple. This location was chosen because it offers a dividing street in what might still be called a residential area. This area is also within the working boundaries of the clients training program.

III. Procedure:

Following a verbal explanation of numbering systems the client locates a street sign indicating which block of Maple was serving as the starting point--for the lesson (100 block). Then probable positions of house numbers will be discussed and appropriate scanning patterns---following sidewalk to door, around door frame, on the porch or garage (see Fig. 23). The client locates house numbers which will include numbers on white background (see Fig. 24), in shadows, in direct light, with dark backgrounds (see Fig. 25), and in script (see Fig. 26). Walking west three blocks on Maple the client establishes the house numbers of the first two houses on the south side of the street (odd). Continued practice is given on the 400 block of Grand River (even) and other blocks if necessary.

IV. Observations:

A. In locating house numbers start with numbers in black on white background, and move to dark numbers and background

B. It may be necessary for the clients to walk into the shadow of a house to get proper illumination for reading the house numbers

C. Again, it may be necessary for the instructor to provide auditory reinforcement for the scanning pattern by positioning himself at the house to point out probable locations of the house numbers

D. The introduction of script lettering instead of numbers is of course dependent on the client's ability to read various print styles

E. Once the client is familiar with numbering intervals in a particular area, scanning the sidewalks and counting intersecting walks can aid in locating a particular number on that block

F. To reinforce the concept of streets dividing other streets into hundred interval blocks, have the client scan and locate the house number after each street crossing to verify the change

G. The client should always be allowed to move to another house to check the number if the number of the first house is not located after lengthy scanning (some houses have no numbers)

H. Start with house numbers which use simple type style rather than ornate design (younger clients may have problems in understanding this style)

Lesson IX

I. Objective:

Continued introduction to numbering systems.

II. Location:

Michigan Street (the east-west street dividing Lansing into north and south sections) at Capitol Street. This location, in contrast to the starting point of Lesson VIII, offers a division street in a somewhat more complex and unfamiliar environment, which will be expanded during the lesson to return the client to a familiar area.

III. Procedure:

Following a review of the explanation of numbering systems given in Lesson VIII the client will locate the street sign indicating which block of Capitol is serving as the starting point of the lesson (100 block). The client establishes the odd-even pattern and then locates several objects both on Capitol and its parallel streets. The client establishes the east-west location and returns by a route of his own choosing to campus. Use of the aid is neither encouraged nor discouraged during this run in order to begin the evaluation of the client's acceptance and utilization of the aid in specific tasks.

IV. Observations:

A. The client should be given a series of numbers to locate from both E-W and N-S streets to demonstrate the establishment of coordinates

B. Previously learned applications for the aid should generally be based on client need in a particular situation rather than instructor's desire for further practice

C. Work with the aid should enhance the overall objective of the lesson and not make learning of numbering systems more confusing

Lesson X

I. Objective:

Drop-off in residential area to evaluate client's progress.

II. Location:

SE corner of Kilborn and Walnut Streets. This location was chosen in order to give the client adequate landmarks with which to orient himself.

III. Procedure:

Client is driven to starting point and given the task of locating a) the mailbox on the NE corner of Maple and Pine, b) 428 Grand River, and c) 427 Grand River (see Fig. 27). The client is given the low vision aid and told that the use of it is entirely optional. The lesson is described as emphasizing orientation rather than low vision aid work.

IV. Observations:

A. All the clients completed the task with little difficulty. The aid was used spontaneously only at the first street sign encountered and the house numbers

B. Goals for the drop-off should not be solely dependent on the low vision aid

C. Success of the client, after the initial orientation at the starting point depends to a great extent on the client's overall orientation skills rather than the use of the aid, which generally served only to verify the client's conclusions about his position

D. The drop-off did show that a thorough familiarization with the potential uses of the aid leads to an almost automatic incorporation of the aid in the tasks which the client is asked to perform

E. Drop-offs should include segments of the environment which can be interpreted through landmarks other than street signs, such as mailboxes, unique house color, large trees, etc.

F. The logical extension of this lesson would be a lesson in a completely unfamiliar area in order to see how the aid is used or not used in self-familiarization and orientation

Lesson XI

I. Objective:

Introduction to crossings at traffic lights.

II. Location:

Pine at Oakland. This intersection offers two one-way streets with some variety in the complexity of traffic light position in relation to crossing points. It represents the type of intersection at which the client must function without the aid of pedestrian signals. The intersection also borders on the residential area with which the client is already familiar and thus offers a logical transition to more complex travel situations. The intersection has well-marked pedestrian crossing lanes.

III. Procedure:

The client approaches the intersection from the NE corner and establishes the traffic pattern, light system and position of lights, as well as the nature of the starting point for crossing and the path of travel to reach the opposite side. (First crossing of Oakland to SE corner and reverse, then crossing Pine to NW corner and reverse.) Elements of the familiarization with and negotiation of crossings which cannot be accomplished with residual vision and/or the low vision aid will be carried out using the other remaining senses. For example, with the aid, verifying traffic patterns by tracking moving traffic; width of street and path for crossing by scanning white pedestrian lines (see Fig. 28); verifying type and position of traffic light (see Fig. 29); localization of turning traffic crossing in front of the cli-

ent; locating and verifying landmarks and clues; sidewalk pattern and type of curb.

IV. Observations:

A. The wait of one or more rotations offers the opportunity to establish the traffic pattern of a given intersection, with or without the aid. Ideally the tracking procedure with the aid can be carried out from all four corners to give a better understanding of traffic movement

B. If client uses the traffic light to cross, he must be able to focus on it while standing at the curb of the street to be crossed in order to be able to move with the first surge of traffic in his parallel street, thus avoiding misunderstandings with traffic turning into the perpendicular street

C. The client should be familiar with the standard auditory procedure where there is no angle at which he can utilize the traffic light visually

D. The visual perception of moving cars can negatively affect the client's crossing technique in moving with the surge of parallel traffic. The client may see cars slowly rolling up to the red light

E. In scanning for traffic lights:

1. Scan corners first and follow any poles
2. Locate diagonal corner of intersection and move upward to locate lights hanging in middle of intersections
3. Any wires located in this procedure should be followed to their source, both right and left
4. Many clients will locate light with unaided vision

F. The client should have a pattern for the exploration of unfamiliar intersections:

1. Locate curb area, crosswalk lines, opposite curb
2. Locate traffic signs, traffic lights, pedestrian signals
3. Establish traffic patterns
4. Establish landmarks of interest

G. Actual crossings using the clip-on 2.5x may aid the client in maintaining visual contact with turning traffic, but practicing this went beyond the scope of our program

Lesson XII

I. Objective:

Crossing at traffic lights with pedestrian signals and heavy traffic.

II. Location:

Washington at Grand River. This intersection offers two two-way streets, wide streets, pedestrian signals, heavy traffic, as well as a great deal of turning traffic. Also there are no grasslines to assist in alignment for travel or crossings, placing importance on proper visual alignment. The crosswalk lines are clear and distinct.

III. Procedure:

The fundamentals of crossing at lights are reviewed. The client then locates the pedestrian lights and observes their relationship to traffic patterns. Emphasis is placed on following turning traffic, and then the client crosses to all four corners and reverses route.

IV. Observations:

A. Pedestrian signals can be utilized without the aid if a) the client can distinguish between the colors for "walk" and "don't walk" or if b) the client can distinguish the position of these lights when they are illuminated

B. Use of the aid initially to read the pedestrian signals can reinforce information given by the instructor. Some clients prefer to always use the aid at this type intersection; others resort to unaided vision

C. Although intersections with pedestrian signals are generally more complex than intersections without them, the client who can utilize pedestrian lights is generally able to negotiate the more complex intersection with relatively little tension

D. At all intersections the client should be aware of standard O & M procedures in case lighting conditions eliminate the utilization of electric signals

Lesson XIII

I. Objective:

Business area familiarization.

II. Location:

Business block (west side of street) of Washington between Allegan and Washtenaw. This business block offers the following elements essential to a basic awareness of business areas: 1) recessed entrances to stores with names located directly above doorway, 2) store names on surface of buildings as well as overhanging signs of various sizes, 3) distinct color differences among store fronts, 4) varying store window shapes, sizes, and display areas, 5) numerous landmarks, and 6) relationships (opposites)--buildings across the street from one another in distinct patterns.

III. Procedure:

The client begins at the SW corner of Allegan and Washington. As the client moves south on Washington the essential elements of the area are demonstrated to him. The client locates a store front with a recessed opening and visually scans to identify objects in the display case and store name (name is usually found above the door and the aid may be necessary here). Continuing on, the client scans display cases and searches for store names. It is pointed out that many store names may be located on store surface above the display cases. The client positions himself away from the store front (toward curb) and scans with or without the aid the store front in an upward movement to locate the sign. This process is

continued with overhanging signs. The client, in a parallel line with the building face scans along the front edge (upward) to locate sign fittings and the sign. The client is shown the varying color differences between store fronts, which can aid his orientation to the area. Landmarks are also utilized in the familiarization process. The use of store fronts with distinct colors and/or store signs with large print on the opposite side of the street are used to enhance the client's overall familiarization of the entire block area by establishing concrete relationships.

IV. Observations:

A. Use block letter signs as the first objectives in a business area

B. The client should be aware of addresses (i.e., numbers) of businesses in order to establish which side of the street a particular business will be located on

C. Subject should use reversed aid (low-power) to locate large signs on the same side of the street as the client (signs on face of building). Unaided vision can be the best method of detection

D. Artificial lighting inside of store may interfere with reading store names on glass backgrounds above doors in recessed entrances. The client may need to position himself at various angles to alleviate this

E. To put clients in the most comfortable location for initial work in business areas, use the shaded side of the street

Lesson XIV

I. Objective:

Continued business area familiarization.

II. Location:

Business block (east side of street) of Washington between Allegan and Washtenaw. See Lesson XIII location for detailed explanation of the area.

III. Procedure:

The procedure for this lesson follows that used for the west side of Washington detailed in Lesson XIII.

IV. Observations:

A. First objects should be relatively unobscured by poles, wires, signs, pedestrians and parked cars. More complex tasks can be inserted in later lessons

B. A reference point, usually a large sign or conspicuous building should be established for each block

C. Scanning pattern for signs on building faces should include locating show windows, moving to the upper edge of the window and then left or right along the windows edge and upward

D. The scanning pattern to locate overhanging signs should include scanning from the sidewalk upward along store fronts and then away from the front when supporting apparatus such as pipes, or wires are located

E. The client should be psychologically prepared to use the aid in areas with large concentrations of other pedestrians

F. Visual scanning of opposite side of street should be done from a standing position to avoid collisions with objects on the same side during travel

G. Awnings may make it necessary for the subject to move to curb to locate signs on building surface and overhanging signs (lower power aids will be necessary due to the closeness of the client to the building fronts)

H. It is wise for the client to position himself out of the flow of pedestrian traffic when using the aid

Lesson XV

I. Objective:

Store familiarization (department/discount store).

II. Location:

Woolco on Waverly in Lansing. This store offers relatively uncluttered aisles (see Fig. 30) in a grid pattern, large department signs located on the walls in regular, symmetrical pattern, good lighting, large department signs suspended above several main aisles, a relatively clear division among the various departments, well-defined reference points, and a representative arrangement of items typical of the large department/discount store.

III. Procedure:

The client enters the main doors which serve as the initial reference point for the lesson. The client will travel a rectangular pattern using the outer perimeter aisles, moving first along the east wall to the south wall to the west wall to the north wall to the entrance. In the course of this travel pattern the client will identify department signs on the wall along which he travels (see Fig. 31). This is accomplished by having the client scan from floor to ceiling at each intersecting aisle until he locates the first sign. At that point the client scans along the wall at the level of the first sign and locates as many following signs as he can. Using the last identifiable sign as an intermediate reference the client moves to it and continues his exploration around the rectangle. Then the client will locate the main N-S

aisle of the store and scan from floor to ceiling to locate suspended department signs (see Fig. 32). After this, the client will establish relationships between various departments and travel to selected objects.

IV. Observations:

A. When assigning directional names to walls, establish visually, with or without the aid, a landmark for each wall

B. The aisles traveled should give adequate distance for use of the aid or be close enough to wall for unaided vision to identify signs

C. Throughout the lesson the client should have the option of using the aid or simply moving closer to signs and objects

D. A hand-held magnifier is of value within specific departments to locate individual items and prices

E. The client should, in the course of familiarization, be given the opportunity to expand on the basic pattern of the lesson by exploring particular items or departments

F. Location of suspended signs may be made difficult by poor contrast due to overhead lighting, as well as poor contrast on the sign itself (see Fig. 33)

G. Scanning intersecting aisles not only alerts the client to congestion (shoppers, crates, etc.) but also will aid in establishing position in relationship to reference points such as the main door, snack bar, windows, emergency exits, etc. This scanning also reinforces the grid pattern in the store

H. The client must be aware of the necessity to refocus the aid for particular tasks, for example when moving from wall signs to scanning ahead along aisles

I. Reference points in general should be high enough on the wall so that they aren't obscured by racks, shelves, etc.

J. Before entering the store the client may wish to establish his relationship at the car to the entrance (see Fig. 34)

K. Young clients may benefit more from familiarization with a small neighborhood store which represents a realistic environment in their home area (see Fig. 35)

L. This lesson could also be similarly conducted in a large grocery store using the procedure described above

Lesson XVI

I. Objective:

Mall familiarization (parked car).

II. Location:

Lansing Mall. This location was chosen as being representative of an enclosed shopping mall with a wide variety of sign types, store openings, constant lighting and easily established landmarks.

III. Procedure:

The client establishes the position of the parked car in the mall parking lot. This is accomplished by visually locating the building front and then setting up a landmark (preferably a store sign on the face of the building) as closely perpendicular to the parking aisle of the client as possible. The client proceeds to his perpendicular traffic (which generally runs parallel with the front of the mall) and relocates his landmark and scans first right and if necessary to the left to locate the mall entrance. He will then enter the mall. In order to show the client the general shape of the mall, he scans the major hallways. The client moves to any intersecting hallways and scans his perpendicular hallway, thus breaking the mall area into its basic segments. The T pattern of this mall should then be clear to the client (other malls may be arranged in L, Y, etc. patterns).

The client then begins to locate specific stores and establishes relationships to other stores by either walking along one wall and scanning to the opposite wall for store signs, or by crossing the hall

in a set pattern walking up to the store, reading the sign and returning back across to the opposite side.

The client should be made aware of the usefulness of display cases, color patterns and landmarks found in the hallway (fountain). The lesson closes by having the client independently locate a series of stores and then return to the parked car.

IV. Observations:

A. If the client, as he walks along one wall, visually can't read the sign, he may need to move to the middle of the aisle way in order to use his low vision aid

B. As the client is attaining his juxtaposition to the mall entrance and no landmarks are readily available on the mall surface, the client may need to count visually the number of aisle ways between him and the entrance

C. The client should position himself out of the flow of pedestrian traffic when using the aid

D. Uniform and constant lighting conditions may make this an easier environment for work with the aid than downtown business areas

E. The store signs differ not only in type but also in color and size. The client should start with block letter signs with good contrast and work up to script (more difficult signs to read)

F. If the client has difficulty reading signs, color differences on store fronts can serve as useful landmarks

Lesson XVII

I. Objective:

Bus familiarization and travel.

II. Location:

Bus stop on Willow Street/Lansing City Bus.

III. Procedure:

After familiarization with different types of buses (school bus of MSB, City of Lansing bus) the client locates the bus stop sign on Willow Street (200 block) for bus to Lansing Mall. As the bus appears the client locates and reads the bus destination sign. (This is a task in tracking of moving buses which only the very accomplished aid user can do with success.) Most tasks of this nature should be done after the bus has stopped. After locating and boarding the bus, the client locates visually an empty seat. As the bus stops at various points along the route the client will attempt to note landmarks and associate them with the particular stop. This is done especially at transfer points and the end of the run.

IV. Observations:

A. Before boarding bus, the client should know the landmarks for the stop he wishes to use on the return trip

B. The client should be aware of the potential danger of attempting to use the aid while standing in a moving bus or in heavy pedestrian traffic

C. If at all possible the client should sit on the curb side of the bus in order to use visual clues and landmarks most effectively

D. The low vision aid is very helpful at central bus stops where many different buses are parked at one time

Figure 1

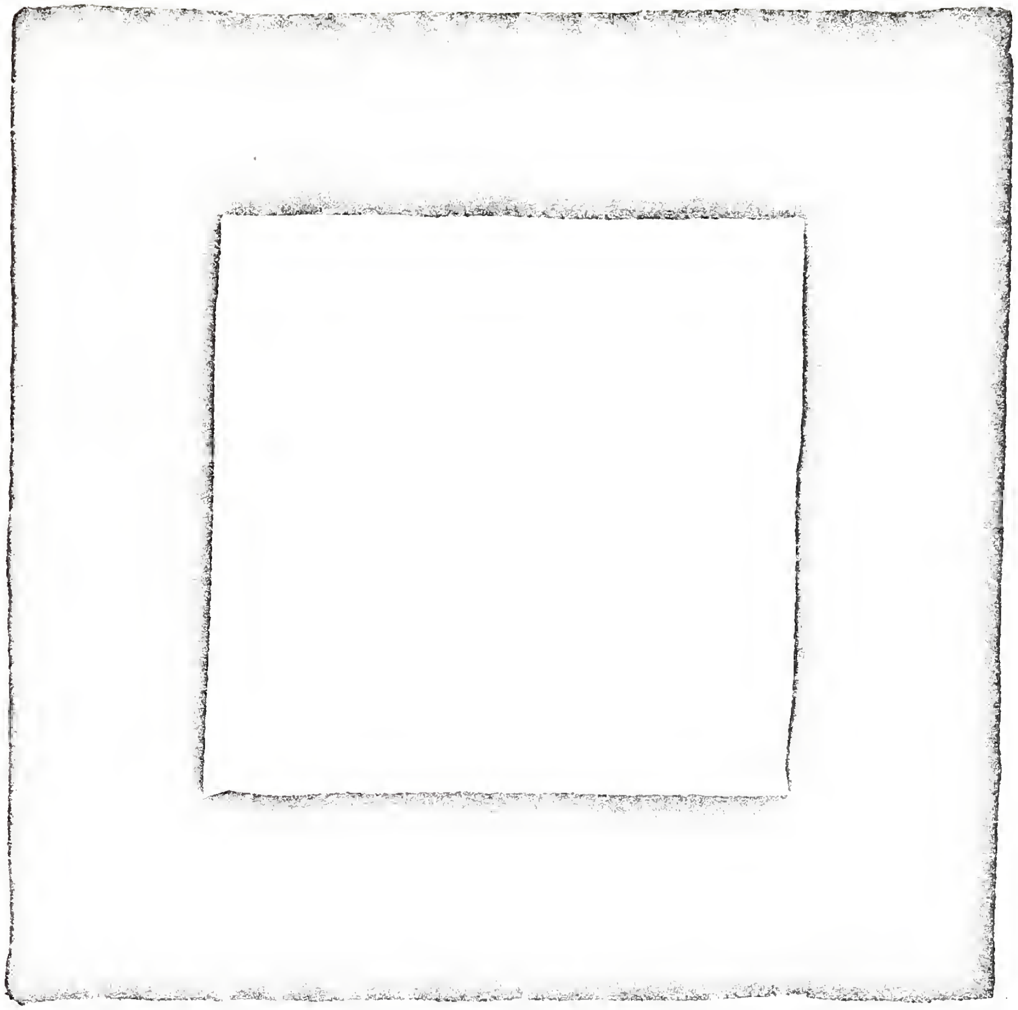

Figure 2

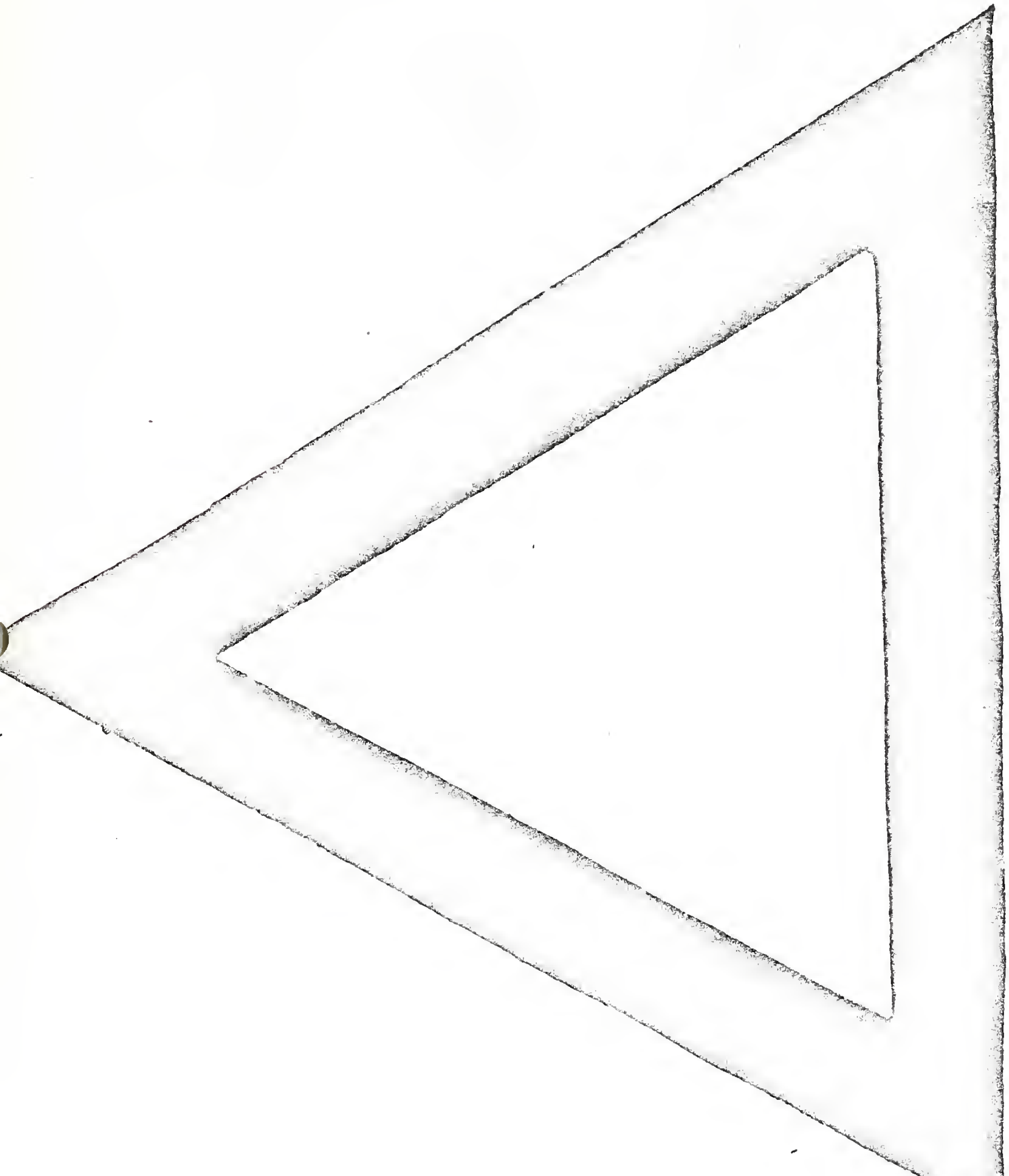

Figure 3

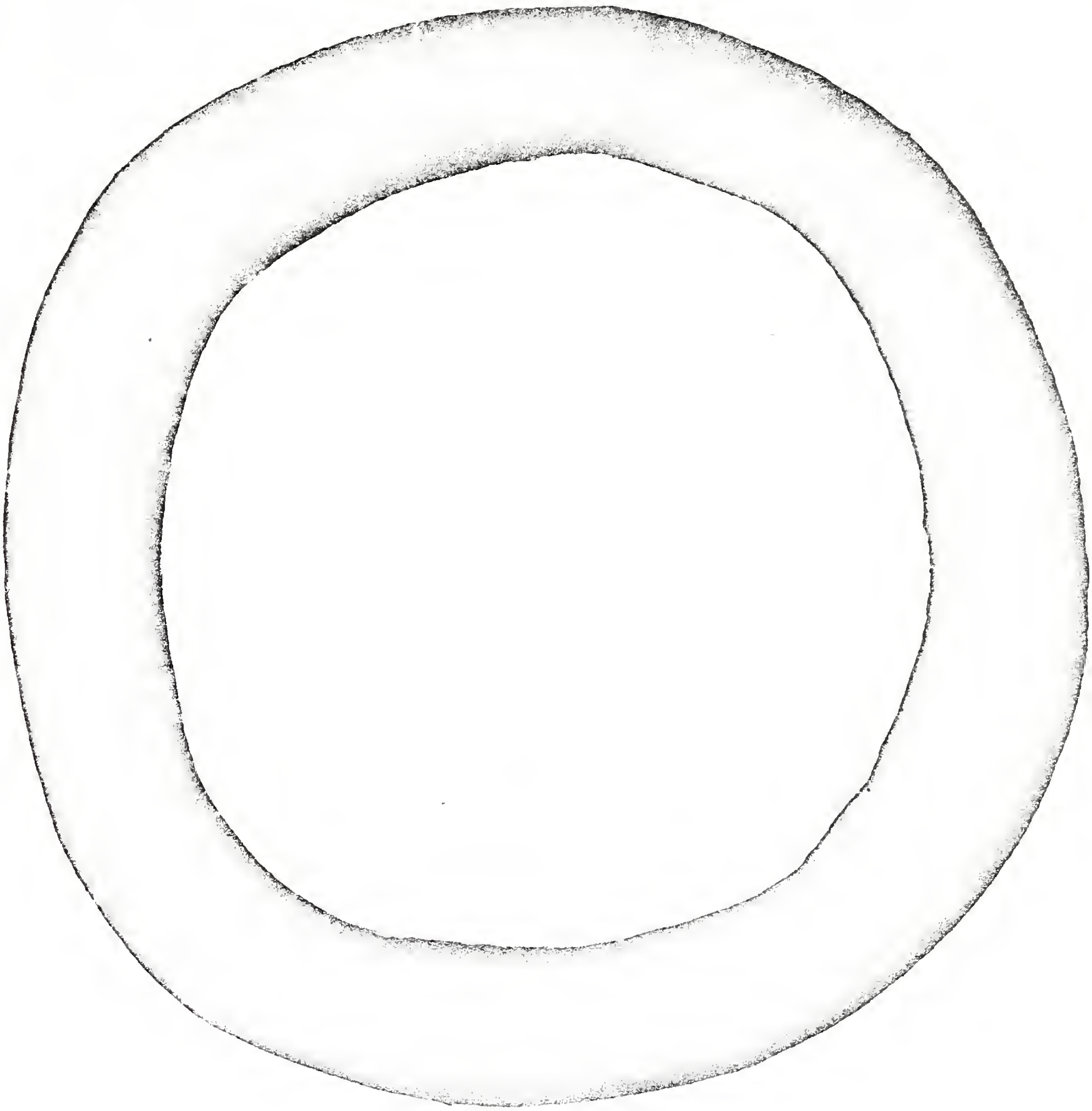

Figure 4

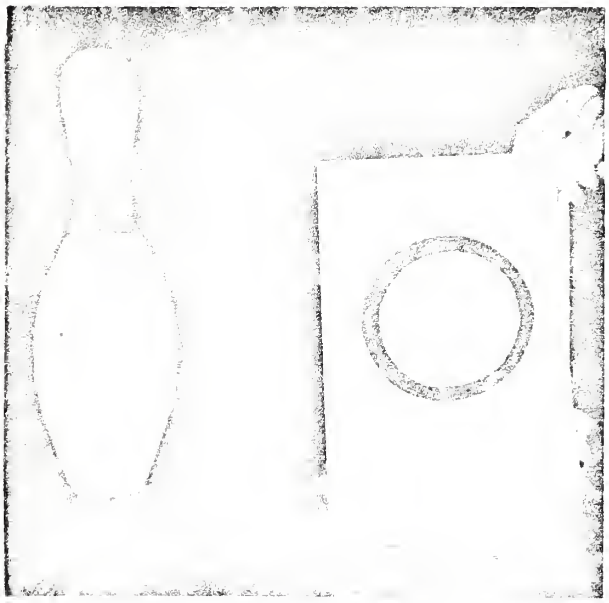

Figure 4a

Figure 5

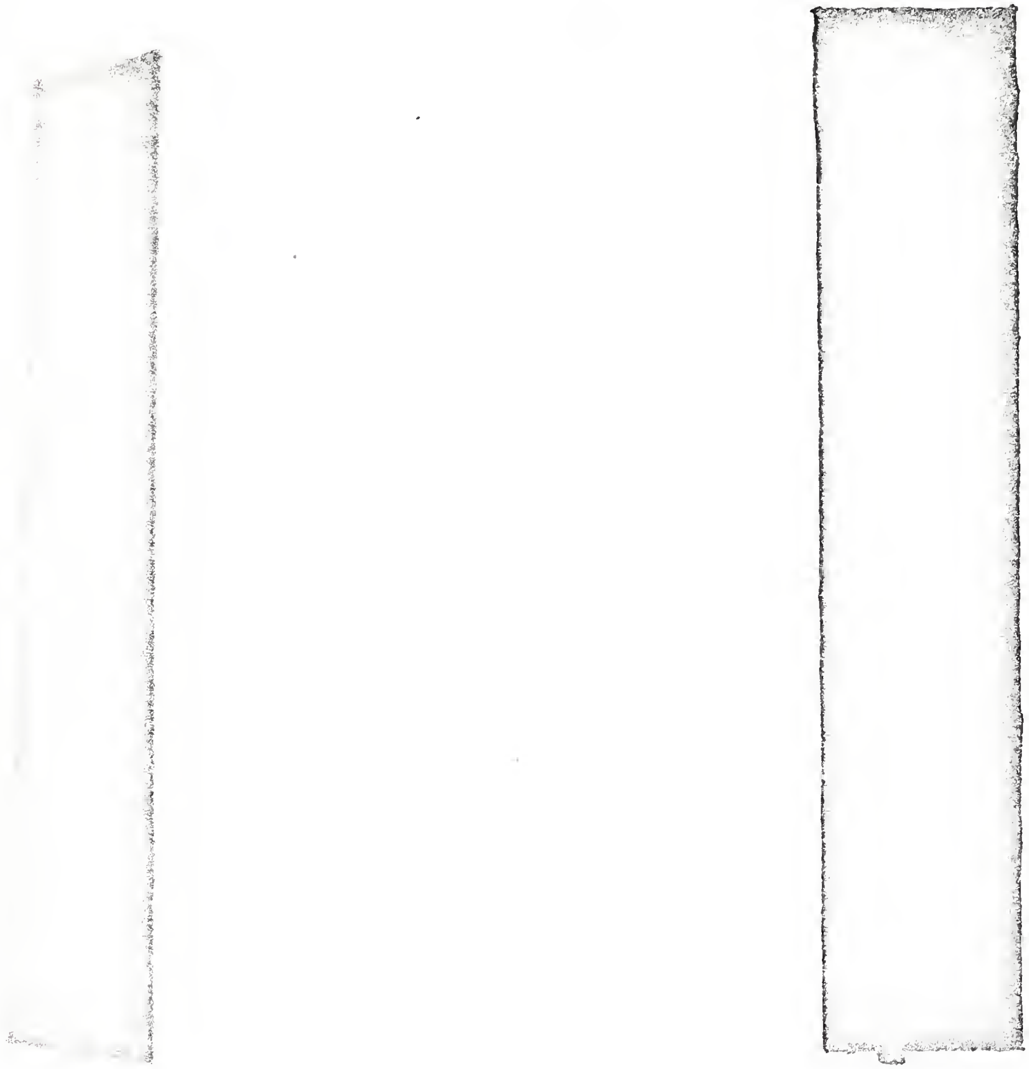

Figure 6

Figure 7

Figure 7a

Figure 8

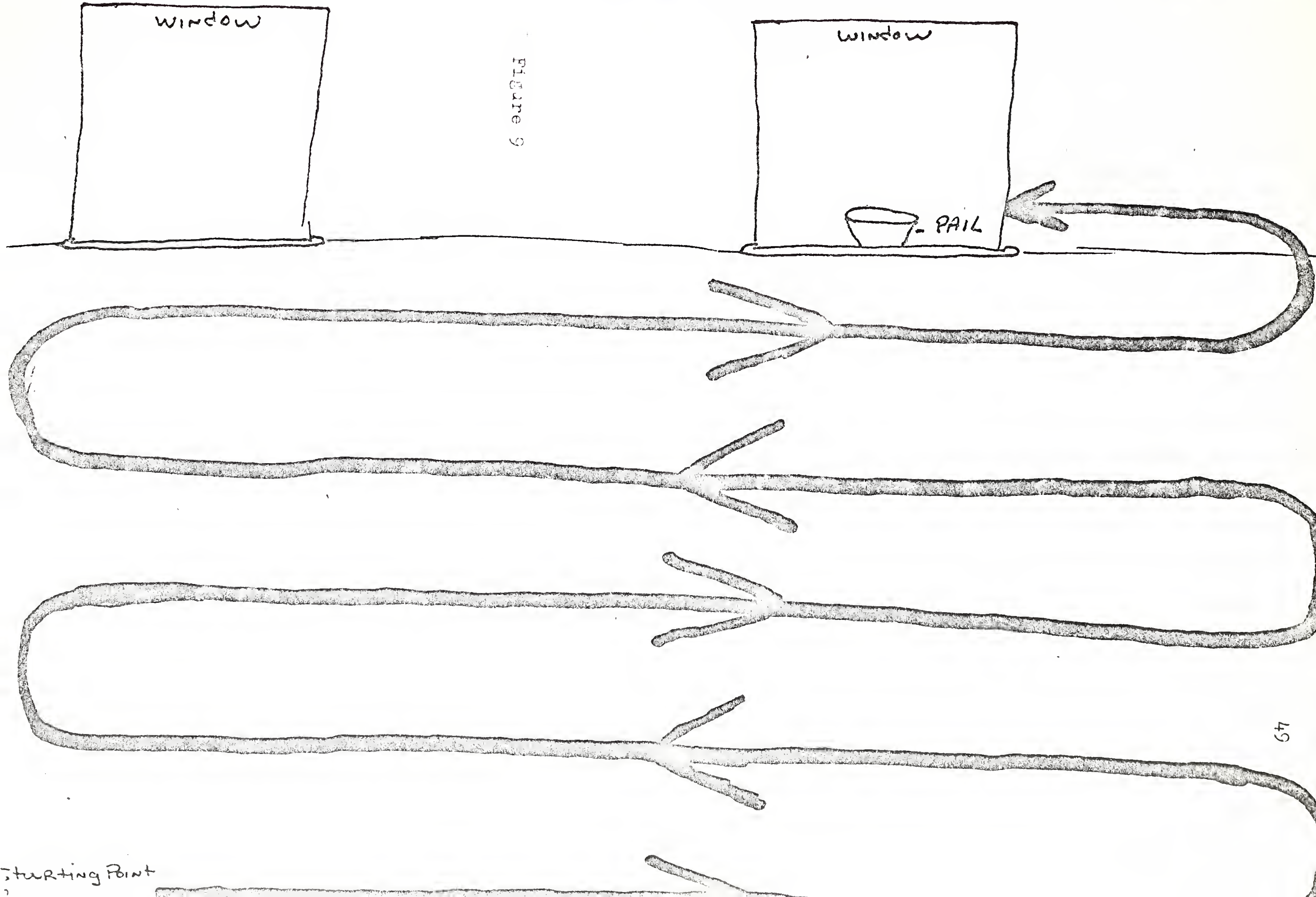

Figure 9

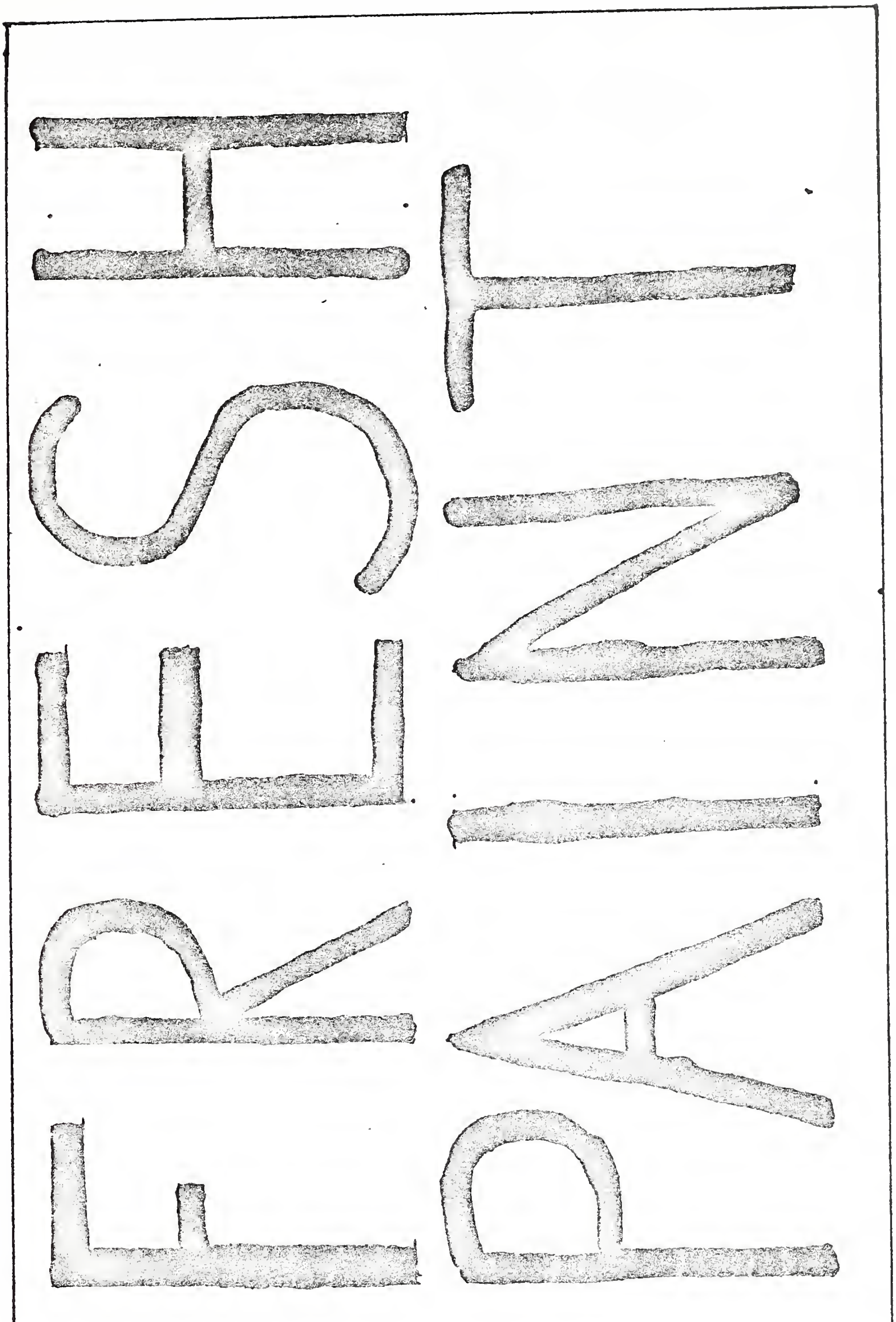

Figure 10

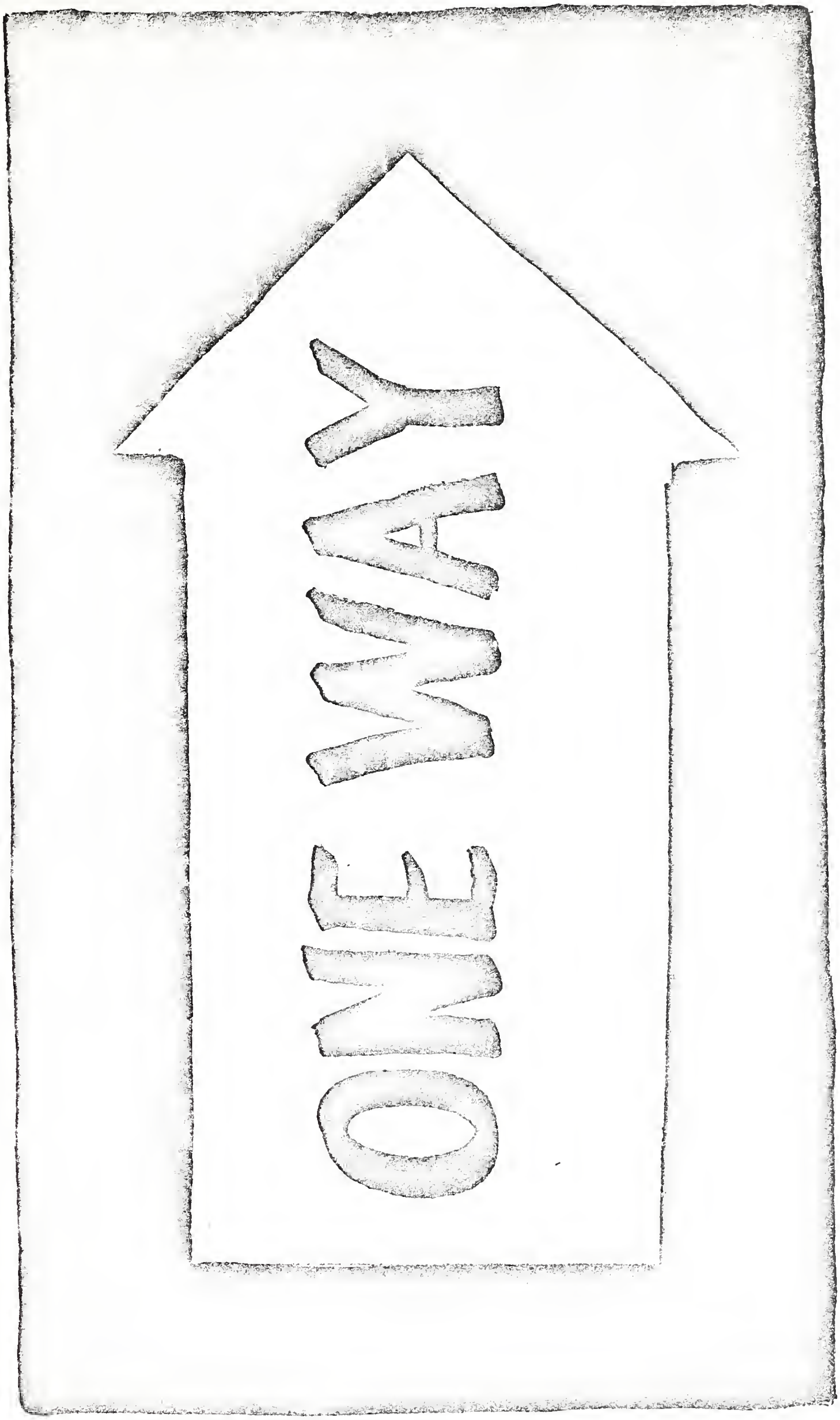

Figure 11

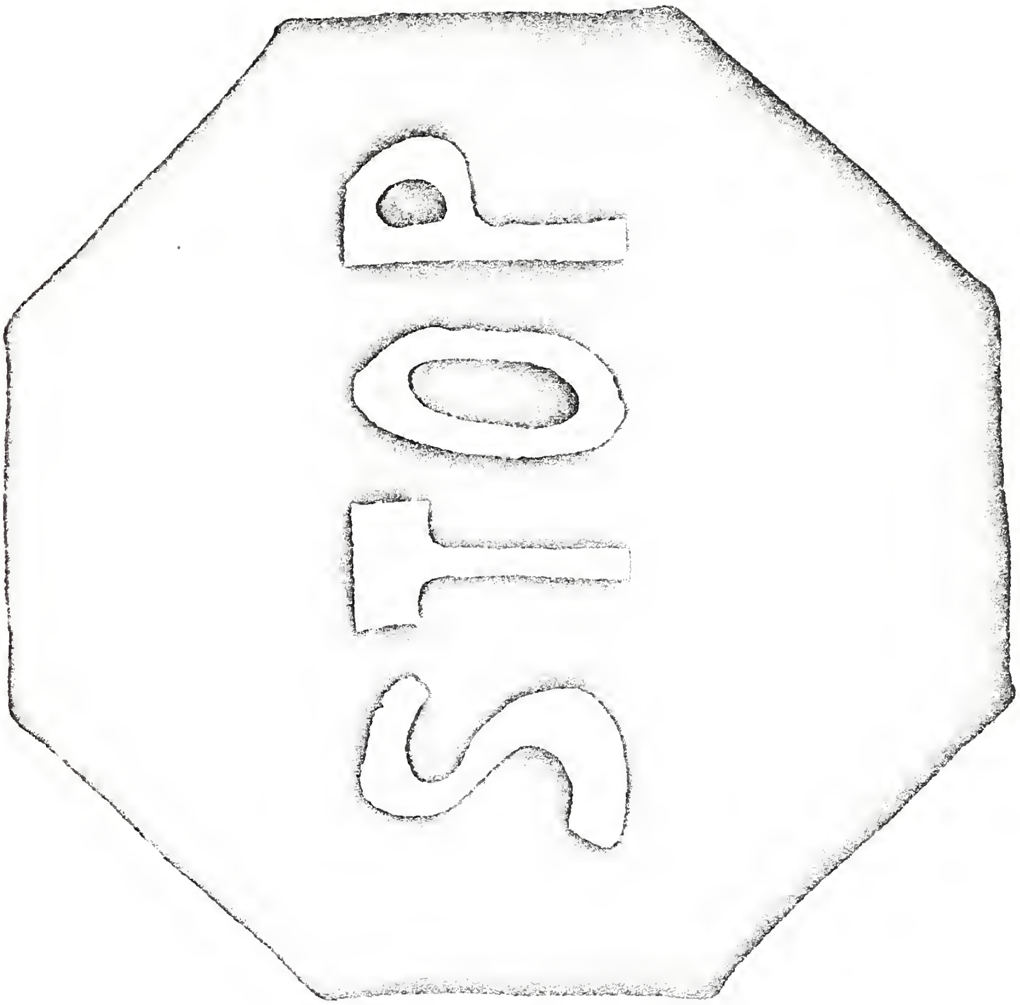

Figure 12

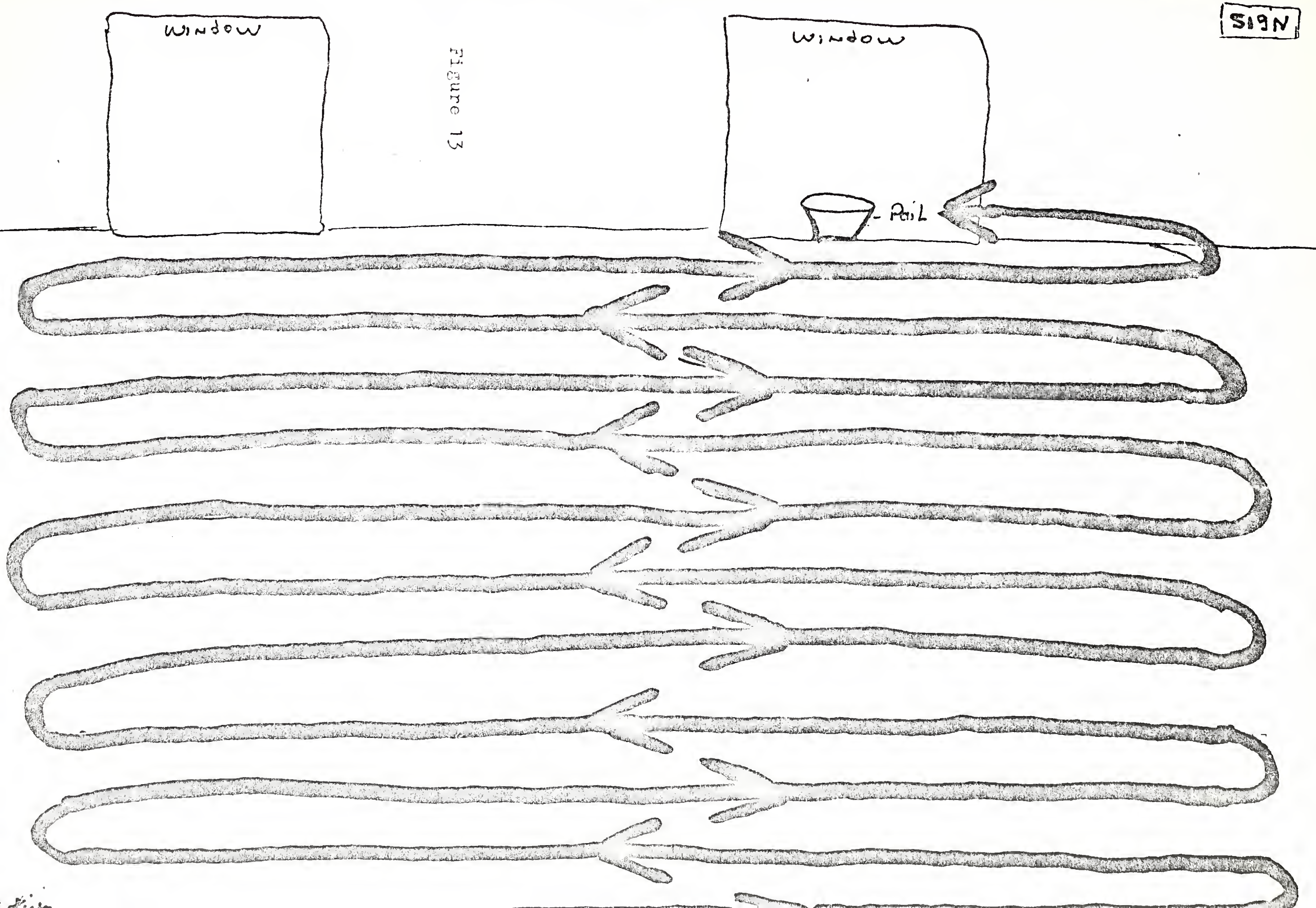

Figure 13

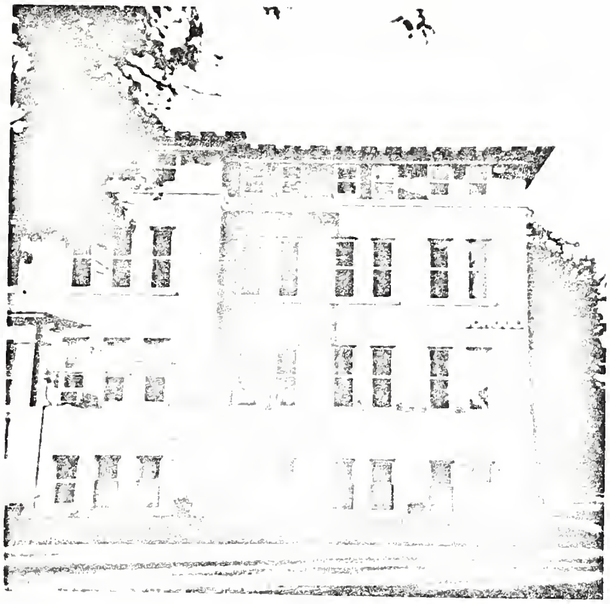

Figure 14

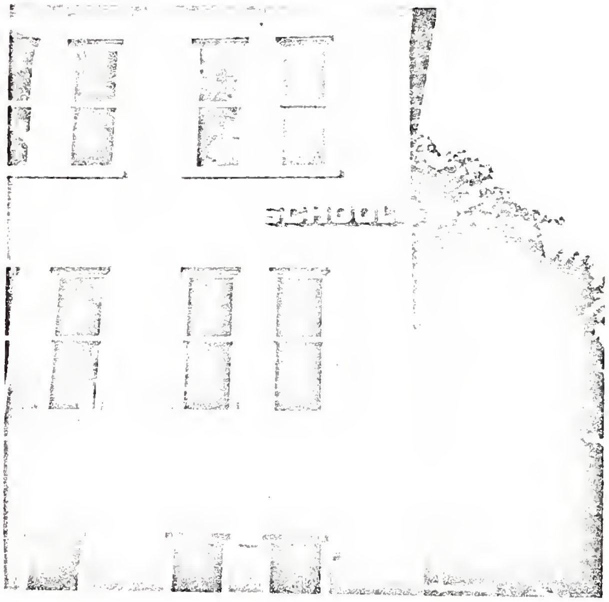

Figure 14a

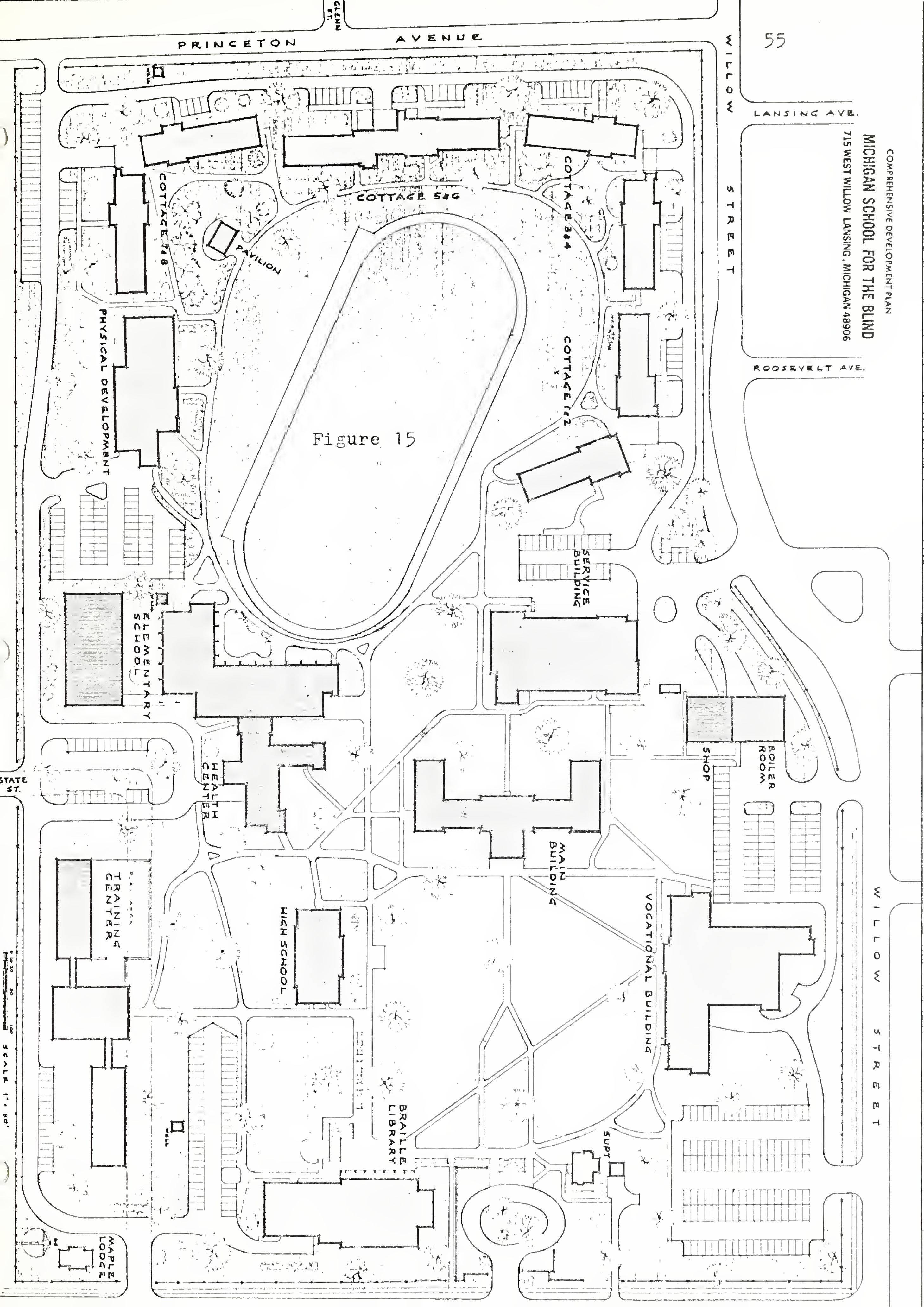
COMPREHENSIVE DEVELOPMENT PLAN
MICHIGAN SCHOOL FOR THE BLIND
715 WEST WILLOW LANSING, MICHIGAN 48906
PRINCETON AVENUE
GLENN ST.
WILLOW STREET
LANSING AVE.
ROOSEVELT AVE.
COTTAGE 7&8
COTTAGE 5&6
COTTAGE 3&4
COTTAGE 1&2
PAVILION
PHYSICAL DEVELOPMENT
ELEMENTARY SCHOOL
SERVICE BUILDING
SHOP
BOILER ROOM
HEALTH CENTER
MAIN BUILDING
STATE ST.
TRAINING CENTER
HIGH SCHOOL
VOCATIONAL BUILDING
BRAILLE LIBRARY
SUPT.
MAPLE LODGE
WILLOW STREET
SCALE 1" = 80'

Figure 15

Figure 16

Figure 17

Figure 18

Figure 19

Figure 20

Figure 21

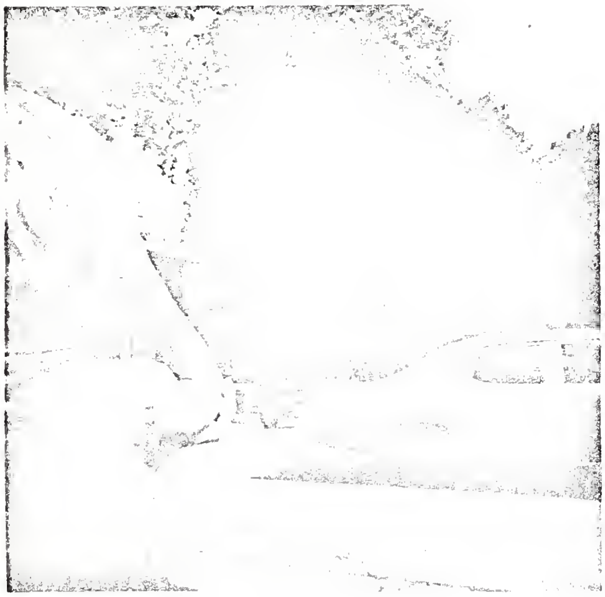

Figure 22

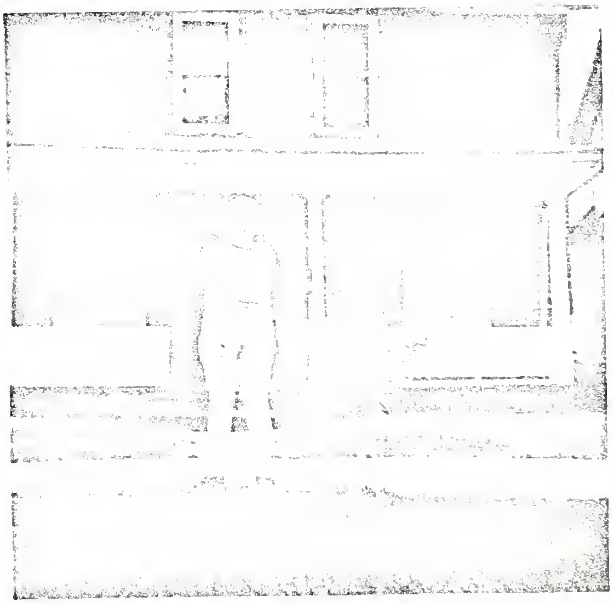

Figure 23

Figure 24

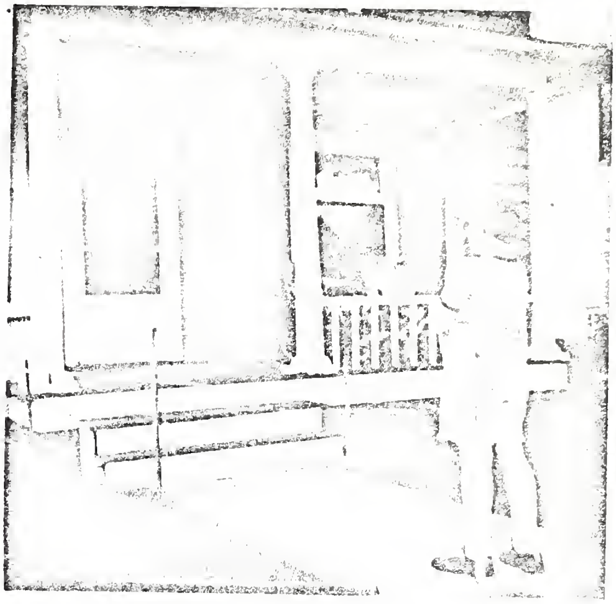

Figure 25

Figure 26

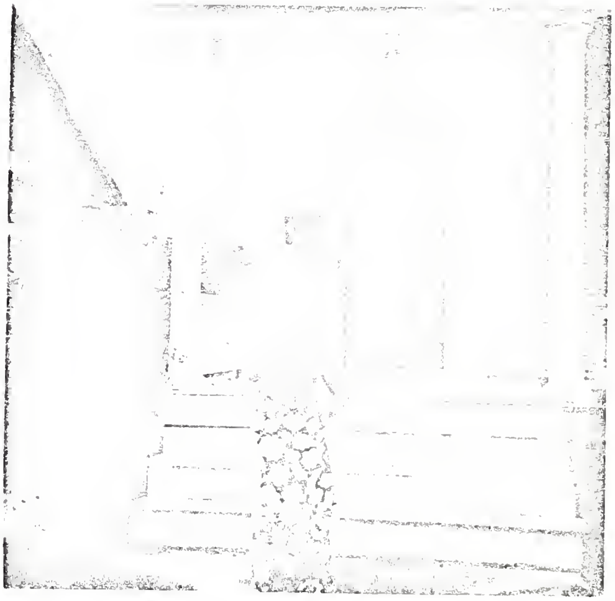

Figure 27

Figure 28

Figure 29

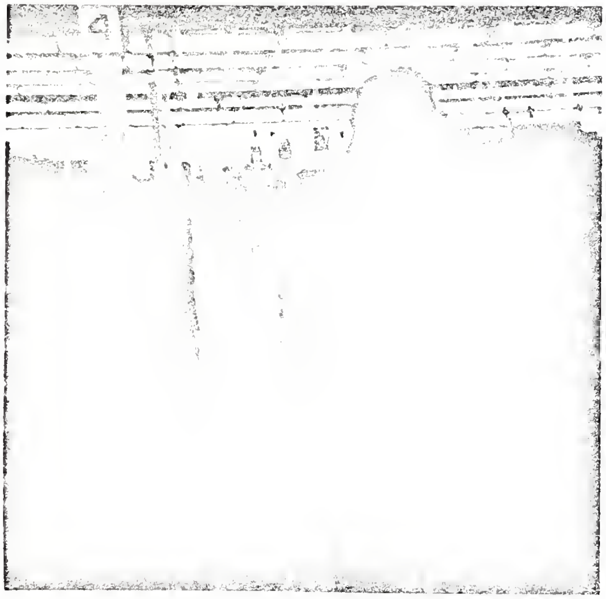

Figure 30

Figure 31

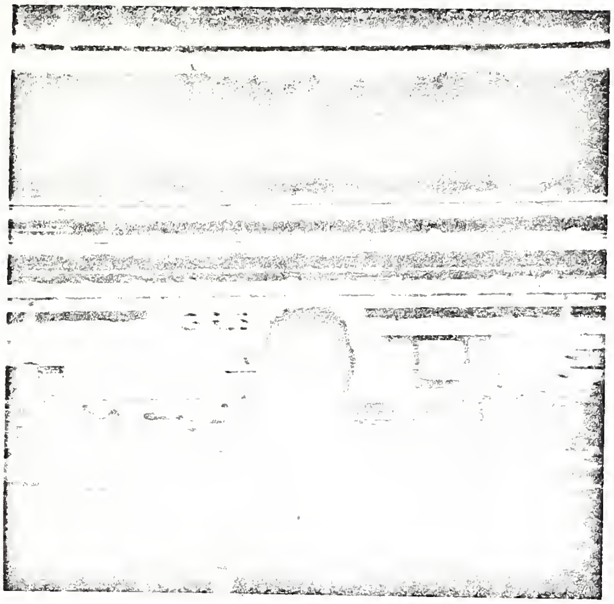

Figure 32

Figure 33

Figure 34

Figure 35

Bibliography

Apple, Loyal E. "Report on Low Vision and Mobility." Long Cane Newsletter 5 (November 1971):19-23.

________. "Editorial." Low Vision Abstracts 1 (Spring 1972).

________, and May, Marianne. Distance Vision and Perceptual Training: A Concept for Use in the Mobility Training of Low Vision Clients. New York: AFB, 1971.

Barraga, Natalie. Increased Visual Behavior in Low Vision Children. New York: AFB, 1964.

Berla, Edward P. "Strategies in Scanning a Tactual Pseudomap." Education of the Visually Handicapped 5 (March 1973):8-19.

Blasch, Bruce, and LaDuke, Robert O. "A Program to Increase Efficiency of Distance Vision for the Partially Sighted." Proceedings of the Low Vision Conference: Visual Abilities--their Behavioral Assessment and Possible Methods for their Improvement in the Individual with Severe Visual Impairments. U.S. Office of Education. Grant No. 0-8-71112-1995(607), November 29-December 1, 1970.

Carter, Kent and Carter, Constance. "Low Vision Aids and Training." Kalamazoo, Mich.: Western Michigan University, 1975. (Mimeographed.)

________. "Itinerant Low Vision Services." New Outlook 69 (June 1975):255-65.

Doyle, James, and Darling, Nancy. "Functional Vision," Long Cane Newsletter 4 (January 1971):6-8.

Eisenberg, Robert. "Letter to the Editor." Low Vision Abstracts 1 (Spring 1973):27-28.

Faye, Eleanor E. et al. Low Vision: A Symposium. Springfield, Illinois, 1975.

________. "Low Vision Services in an Agency: Structure and Philosophy," New Outlook 69 (June 1975):241-48.

Flannegan, C., and Roberts, H. A Concentrated O & M Approach for the Development of Education for Partially Seeing and Blind Children in Day School Settings. Kansas: State Department of Education, December 1969.

Fonda, Gerald. "Low Vision Correction for Congenital Cataracts and Surgical Aphakia in Children," Sight-Saving Review 39 (Summer 1969):85-92.

________. "Evaluation of Telescopic Spectacles." Journal of American Ophthalmology (September 1961):433-35.

Jose, Randall T. et al. "Optical Aids: An Interdisciplinary Prescription." New Outlook 67 (January 1973):12-18.

________. "The Model Low Vision Clinical Service: An Interdisciplinary Vision Rehabilitation Program." New Outlook 69 (June 1975):249-54.

Kaine, Patricia. Low Vision Clinic Making Advances in Optical Aids Now Available to Improve Visual Acuity of Persons with Low Vision. Cleveland Society for the Blind, No. RD-400, 1963.

Kederis, Cleves, and Ashcroft, S. C. "The Austin Conference on Utilization of Low Vision," Education of the Visually Handicapped 2 (May 1970):33-38.

Keller, George. A Mobility Project with Blind Public School Students and Other Selected Rehab Clients. Maryland: State Department of Education, July 1970.

Koehler, Charles P. "The Use of Optical Aids to Assist the Partially Seeing in Mobility." Long Cane Newsletter 4 (January 1971):9-10.

Little, Regina. "Getting the Most out of Visual Aids." New Outlook 59 (April 1965):141-44.

Lynch, Jacqueline A. "A Review of the History of Low Vision Aids and the Implications of this for the Future." Kalamazoo, Mich.: Western Michigan University, 710 Paper, 1967.

Margach, Charles B. "Spatial Perception in Low-Visioned Persons." Paper presented at the Biennial Conference of the Association for the Education of the Visually Handicapped, Toronto, Canada, June 1968.

Mehr, Edwin B., and Fried, Allan N. Low Vision Care. Chicago: 1975.

Morse, Kathy et al. Mobility for the Partially Sighted. Perkins School for the Blind. January 1975.

Petrizzi, Suzanne. "Low Vision Aids, Monocular Aids and Sunware Used in Diagnostic Orientation and Mobility Program at the New York Association for the Blind." Long Cane News 4 (January 1971):11-14.

Richterman, Harold. "Mobility Instruction for the Partially Seeing." New Outlook 60 (October 1966):236-38.

Schulz, Paul. "Psychological Factors in O & M Training." New Outlook 65 (May 1972):129-34.

Silver, Robert. "Using Residual Vision." New Outlook 59 (March 1965):93-94.

Vigoroso, Hugo. "The Partially Sighted Client." Long Cane Newsletter 4 (April 1970):4-10.

3/4/2011
T 222712 5 56 00
HF GROUP-IN